

CLAIM AMENDMENTS

1 - 52. (canceled)

1 53. (new) A device comprising:

2 a plurality of electrodes each capable of stimulating a
3 neuron population having a pathologically synchronous neuronal
4 activity; and

5 means for generating and feeding stimulation signals to
6 the electrodes for stimulation by each of the electrodes a
7 respective neuron subpopulation of the neuron population and
8 resetting or reversing with the stimulation signals phases of the
9 stimulated neuron subpopulation at different points in time.

1 54. (new) The device of claim 53 wherein a stimulation
2 signal is an individual pulse or a pulse train.

1 55. (new) The device of claim 53 wherein
2 the number of the plurality of electrodes is N,
3 the neuron population has a pathologically oscillatory
4 neuronal activity with a mean period duration T, and
5 the stimulation signals are fed by the means to the
6 electrodes such that a phase offset between two neuron
7 subpopulations substantially amounts to T/N .

1 56. (new) The device of claim 55 wherein the
2 stimulation signals are repeatedly fed to the electrodes by the
3 means such that time intervals between successive stimulation
4 signals are substantially whole number multiples of the mean period
5 duration T.

1 57. (new) The device of claim 53 wherein
2 at least one electrode of the plurality of the
3 electrodes stimulates the respective neuron subpopulation directly,
4 or

5 at least one electrode of the plurality of the electrodes
6 stimulates a further neuron population that is connected to the
7 respective neuron population having the pathologically synchronous
8 neuronal activity by a nerve fiber bundle, or

9 at least one electrode of the plurality of the electrodes
10 stimulates a nerve fiber bundle that is connected to the neuron
11 population having the pathologically synchronous neuronal activity.

1 58. (new) A device comprising:
2 a plurality of electrodes each capable of stimulating a
3 neuron population having a pathologically synchronous neuronal
4 activity; and

5 means for generating and feeding phase-resetting or
6 phase-reversing stimulation signals to the electrodes such that two
7 successive phase-resetting or phase-reversing stimulation signals
8 are fed into different electrodes at respective offset times.

1 59. (new) The device of claim 58 wherein the phases of
2 the two successive phase-resetting or phase-reversing stimulation
3 signals are temporally offset relative to one other.

1 60. (new) The device of claim 58 wherein a
2 phase-resetting or phase-reversing stimulation signal is an
3 individual pulse or a pulse train.

1 61. (new) The device of claim 58 wherein the time
2 offset between successive phase-resetting or phase-reversing
3 stimulation signals is substantially constant.

1 62. (new) The device of claim 58 wherein
2 the number of the plurality of electrodes is N,
3 the neuron population has a pathologically oscillatory
4 neuronal activity with a mean period duration T, and
5 a time offset between two successive phase- resetting or
6 phase-reversing stimulation signals substantially amounts to T/N .

1 63. (new) The device of claim 62 wherein
2 phase-resetting or phase-reversing stimulation signals are
3 repeatedly fed into an individual electrode such that time
4 intervals between successive phase-resetting or phase-reversing
5 stimulation signals are substantially whole number multiples of the
6 mean period duration T.

1 64. (new) A device comprising:

2 a plural number N of electrodes each capable of
3 stimulating a neuron population having a pathologically oscillatory
4 neuronal activity with a mean period duration T; and

5 means for generating and feeding stimulation signals to
6 the electrodes such that a time offset between two successive
7 stimulation signals that are fed into different electrodes
8 substantially amounts to T/N .

1 65. (new) The device of claim 64 wherein the time

2 offset between the phases of the two successive stimulation signals
3 substantially amounts to T/N .

1 66. (new) The device of claim 64 wherein

2 each of the electrodes stimulates a respective neuron
3 subpopulation of the neuron population, and

4 a stimulation signal resets or reverses a phase of the
5 respective stimulated neuron subpopulation.

1 67. (new) The device of claim 64 wherein stimulation

2 signals are repeatedly fed into an individual electrode such that
3 time intervals between successive stimulation signals are
4 substantially whole number multiples of the mean period duration T.

1 68. (new) A method comprising the steps of:
2 applying stimulation signals to a plural number N of
3 stimulation sites of a neuron population having a pathologically
4 synchronous neuronal activity such that
5 the stimulation signals reset or reverse a phase of
6 neuron subpopulations situated at the respective stimulation sites,
7 and
8 two successive stimulation signals applied to different
9 stimulation sites are temporally offset relative to one other.

1 69. (new) The method of claim 68 wherein the phases of
2 the two successive stimulation signals are temporally offset
3 relative to one other.

1 70. (new) The method of claim 68 wherein the time
2 offset between successive stimulation signals is substantially
3 constant.

1 71. (new) The method of claim 68 wherein the neuron
2 population has a pathologically oscillatory neuronal activity with
3 a mean period duration T, and the time offset between the two
4 successive stimulation signals substantially amounts to T/N.

1 72. (new) The method of claim 71 wherein stimulation
2 signals are repeatedly applied to an individual stimulation site
3 such that time intervals between successive stimulation signals are
4 substantially whole number multiples of the mean period duration T.

1 73. (new) The method of claim 68 wherein the method is
2 used to treat pathologies, in particular parkinsonism, essential
3 tremor, dystonia, obsessive disorders or epilepsy.

1 74. (new) A method comprising the step of
2 applying stimulation signals to a number N of stimulation
3 sites of a neuron population having a pathologically oscillatory
4 neuronal activity with a mean period duration T and with a time
5 offset between two successive stimulation signals applied to
6 different stimulation sites substantially equal to T/N .

1 75. (new) The method of claim 74 wherein the time
2 offset between the phases of the two successive stimulation signals
3 is substantially equal to T/N .

1 76. (new) The method of claim 74 wherein a stimulation
2 signal applied to the respective stimulation site resets or
3 reverses a phase of a neuron subpopulation situated at the
4 respective stimulation site.

1 77. (new) The method of claim 74 wherein stimulation
2 signals are repeatedly applied to an individual stimulation site
3 such that time intervals between successive stimulation signals are
4 substantially whole number multiples of the mean period duration T.